

Main Characteristics of Statistical Data and the Statistical System for Wood and Wood-processing Products in Vietnam

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Accepted: 9 September 2010 / Published online: 24 October 2010
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Abstract This paper describes the characteristics of data about wood and wood-processing products published in Vietnam. The characteristics include inconsistency of data published by major data sources, lack of necessary data, and irregular publication frequency. Reasons are identified for the existence of the above characteristics of data for the wood and wood-processing industries, including recent changes in the functions of state statistical organizations and unclear concepts of data published. These characteristics create difficulties for researchers and policy-makers working at the Ministry of Agriculture and Rural Development for analysing policies and establishing supply targets for the wood and wood-processing industries in 5-year economic plans. To improve the statistical system, co-operation between state organisations and the information network (e.g. computers and internet connection) requires strengthening.

Keywords Engineered-wood product · Conversion rate · Enterprise definition · Sub-industry · General statistical office

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Introduction

The reform of markets and land-use policies in the forestry industry, commencing in 1993 and 1988, respectively, was implemented about 7 years later than in other industries in Vietnam. The allocation of forest land to farmers commenced in 1993 (Phan 2004). State forestry enterprises were reorganized according to public and business functions. This process was accelerated in 1998. Consequently, the wood-processing industry only grew slowly in the 1990s but growth accelerated in the first decade of 2000s. The average growth of export revenue was more than 30% per year in the years 2001–2007. Total export revenue was 61 million USD in 1996, 1.55 billion USD in 2005, 2.2 billion USD in 2006 and 3.2 billion USD in 2008. As a result, the export turnover of wood-processing products became greater than that of many other important commodities, including rice, pepper, rubber and coffee. Since 2006, wood-processing products have become the fifth highest export revenue earner in Vietnam and the second largest exporter of wood products in Southeast Asia (Ministry of Foreign Affairs of Denmark (MoFAD) 2008).

The re-organisation of the statistical system in the wood and wood-processing industries was implemented much later, commencing in September 2005. The statistical system has not caught up with changes in the Vietnamese forestry and wood-processing industry, especially in rural areas where wood and wood-processing products are produced by small-scale enterprises.

This paper examines the limitations of historic data published by the main organisations in Vietnam dealing with wood and wood-processing products. The statistical system for the forestry and wood-processing industry in Vietnam is described. Comments are provided about causes of data inconsistency. Finally, suggestions are made to improve the statistical system.

Main Characteristics of Data About Wood and Wood-Processing Products Published in Vietnam

The four main characteristics of data about wood and wood-processing products published in Vietnam may be identified, as described below.

Inconsistencies in Data from Different Sources

Table 1 summarises information about the total number of wood-processing enterprises in Vietnam reported by various sources. According to the General Statistical Office (GSO) (cited by GTZ 2007), Vietnam had more than 4,000 wood-processing enterprises in 2004. Of these, 1,478 were wood and bamboo processing enterprises, between 1,500 and 1,800 were sawmills and about 300 were paper enterprises. Regarding sawmills, USDA (2003, cited in Barney 2005) reported that there were 1,200 sawmills in 2003, while GSO (cited by GTZ 2007) reported that the number was between 1,500 and 1,800. Regarding the woodchip sub-industry, Vietnam has between six and 16 enterprises, with numbers depending on the data sources. For example, the Asian Development Bank (ADB, cited in Barney 2005)

Table 1 Reported number of enterprises by types and data sources

Type of enterprise	Reported number	Date	Source
Wood-processing	Over 2,000	2005	Truong and Bui (2005)
Wood-processing	1,500	2008	MARD 2008, cited in Embassy of Denmark (2009)
Wood-processing	Over 4,000	nd	GSO, cited in GTZ (2007)
Wood-processing and trading	1,200	2003	Vietnam Economy, 2003, cited in Barney (2005)
Wood-processing and trading	1,500	2003	USDA 2003, cited in Barney (2005)
Wood-processing	1,200	nd	MARD, cited in GTZ (2007)
Wood-processing	1,200	nd	MARD (2007)
Woodchip	9	2000	ADB 2000, cited in Karsenty (2006)
Woodchip	16	2005	USDA 2005, cited in Karsenty (2006)
Woodchip	11	2003	Karsenty (2006)
Woodchip	6	2003	Barney (2005)
Woodchip	15	2003	Vietnam Business Finance News (2009)
Woodchip	50	2008	Vietnam Business Finance News (2009)
Paper enterprise	300	nd	GSO, cited in GTZ (2007)
Paper enterprise	95	1997	Pham (1997)
Furniture	Over 2,000	2008	Ho Chi Minh City Handicraft and Wood Industry Association HAWA (2008)
Furniture	1,200	2005	Theresa (2005)
Sawmill	1,200	2003	USDA 2003, cited in Barney (2005)
Sawmill	1,500–1,800	2003	GSO 2004, cited in GTZ (2007)
State forestry enterprise	412	Early 1990s	Sikar, cited by Lang (2001a)
State forestry enterprise	403	2000	GSO (2005)
State forestry enterprise	304	2004	GSO (2005)
State forestry enterprise	362	2005	MARD, cited by GTZ (2007)

nd No date are reported

identified nine woodchip enterprises in 2000, whereas USDA (cited in Karsenty 2006) reported 16 woodchip enterprises in 2002, and MARD (cited in Barney 2005) reported only six in 2003. The number of state forestry enterprises (SFEs) was 412 in the early 1990s (Sikar, as cited by Lang 2001a). According to GSO, the total number of SFEs was 403 in 2000 and declined to only 304 in 2004. In contrast, according to the Ministry of Agricultural and Rural Development (MARD 2006, cited in GTZ 2007), there were 362 SFEs in 2005. Since 2007, MARD has been preparing a more up-to-date dataset of SFEs.

Data reported about the average productivity of timber in planted production forests differs greatly between major data sources. In Vietnam, many provinces have not conducted timber productivity surveys. Some surveys have been conducted by domestic and international research organisations in particular districts in selected provinces, for instance, Phu Tho province (ICARD 2002a), Thai Nguyen

province (ICARD 2002b), Lao Cai, Phu Tho and Hoa Binh provinces (Lamb and Huynh 2006) and Thua Thien Hue province (Meulen 2006).

According to ICARD (2008), average timber productivities have been reported in the same way, in terms of measurement units, but the average productivity estimates differ between major sources, for instance 4 m³/ha/year (GSO 2008) and 8 m³/ha/year (ICARD 2002a, b; DoF 2008). The Forest Sector Development Strategy (cited in Barney 2005) reported that average productivities range from 8 to 10 m³/ha/year. Barney (2005) interviewed managers of woodchip enterprises in Vietnam and obtained average productivity estimates of 20–25 m³/ha/year, but mainly in southern Vietnam. Various surveys were conducted on growth performance of some timber tree species planted in production forests, including acacias and eucalypts. As of December 2008, no official surveys of other timber tree species over a wider area (i.e. many provinces) were identified. ICARD (2008) reported timber productivity estimates by employees and state officers working for Hoanh Bo State Forestry Enterprise, of 6 m³/ha/year for eucalypts, 7 m³/ha/year for acacias, 5 m³/ha/year for *Pinus* spp., 4 m³/ha/year for bamboo, and 5 m³/ha/year for *Styrax tonkinensis*.

The area of timber trees in planted production forests was also reported differently by major sources. According to the Forest Inventory Plan Institute (FIPI, cited in Barney 2005), acacias, eucalypts and pines accounted for 54% of the total plantation area in Vietnam in 2000. However, this figure was 57.2% according to the Central Board of Forest Statistics and 48.6% according to Barney (2005).

Inconsistencies in Estimates of the Supply of High Quality Timber

The supply of timber for the wood-processing industry in Vietnam has been not reported accurately. The high export revenue growth of wood-processing in Vietnam relied on imported logs and sawn timber, which accounted for 80% of supply in 2006 (MARD 2007). However, the data about wood and wood-processing products published by GSO (2008) does not indicate clearly from which countries logs were imported, what types of forest logs were harvested domestically, or what types of processing activities were carried out by Vietnam's wood-processing enterprises. According to USDA (cited in Barney 2005), from 2001 to 2003 wood-processing products in Laos and Cambodia were re-exported through Vietnam by Vietnamese import and export enterprises. A large export quantity of logs imported into Vietnam was harvested in the natural forests of Laos and Cambodia and was not officially reported. The exported Cambodian logs were illegal because the Cambodian government bans log exports. Logs harvested in natural forests in Laos and Cambodia are usually high-value timbers for the furniture sub-industry in Vietnam.

Although the Government of Vietnam (GoV) has allowed a limited annual quantity of timber to be harvested from natural forest areas, usually from 150,000 to 350,000 m³ (Nguyen et al. 2006), Nguyen (2003, cited in Barney 2005) noted that in the early 1990s about 2–4.5 M m³/year of roundwood was illegally harvested from Vietnam's natural forest areas. Illegal logging in Vietnam has been serious but

Table 2 Quantity conversion rates between measurement units

Forest product type	Original quantity unit		Alternative quantity unit	
	Quantity unit	Quantity	Quantity unit	Quantity
Logs of eucalypt species	m ³	1	Ton	1
Logs of acacia species	m ³	1	Ton	0.83
Logs of <i>Pinus</i> spp.	m ³	1	Ton	0.87
Fresh bamboo	m ³	1	Ton	0.5
Fresh bamboo	Stere	1	m ³	0.65
Logs of <i>Styrax tonkinensis</i>	m ³	1	Ton	0.83

These conversion rates were first estimated by the first author and his working group and then presented to obtain comments from foresters, wood-processing experts and state officers managing information in three data review meetings, on 7 November 2008 at the Quang Ninh Department of Agriculture and Rural Development, on 8 November 2008 at Hoanh Bo state forestry enterprise in Quang Ninh province, and on 14 November 2008 at the Informatics and Statistics Centre for Agriculture and Rural Development (ICARD) in Hanoi City

undocumented since 1998, as reported in Barney (2005) and Phan and Morris (2008).

Variations in Timber Measurement Units and in the Conversion Rates Between Unprocessed and Processed Timber

Four main measurement units are used by farmers and processors to represent quantities of wood and wood-processing products, namely the bundle, ton, cubic metre and stere (ICARD 2002a, b). A bundle (about 10 kg) is the usual measure for firewood. A stere is a measure of quantities of bamboo; one stere is equal to one cubic metre, but is usually lighter than one cubic metre of timber because bamboo is not solid. When selling their products, farmers use units directed by traders, which can be all four units. Wood-processing factories normally use ‘ton’ as the demand quantity unit. Researchers and policy-makers normally use ‘ton’ and ‘m³’ in their

Table 3 Quantities of inputs required to produce one ton of outputs in the wood and wood-processing industry

Main input	Quantity (tonnes)	Corresponding output	Quantity (tonnes)
Low quality logs	1.8	Woodchip	1
Woodchip	1.1	Engineered-wood	1
Woodchip	1.3	Pulp	1
Pulp	1.15	Paper	1
High quality logs	2.22	Sawn-wood	1
Sawn-wood	1.53	Solid-wood furniture	1
Engineered-wood	1.25	Engineered-wood furniture	1

These conversion rates were first collected by the first author and his working group and then presented to elicit comments from foresters, wood-processing experts and state officers managing information in the three data review meetings listed above. The rates were finally checked by managers of wood-processing factories that were visited by the first author and his working group in September and November 2008

studies and official government documents respectively. Although these transformation rates between units may be known by domestic experts, they are not published officially. According to Castren (cited in Barney 2005), the average conversion rate of wood was reported as 6.7 m³ to 5 tonnes. Table 2 reports conversion rates estimated by ICARD (2008).

Reported conversion rates between tonnes of a main input and tonnes of an output also differ between research reports. Castren (cited in Barney 2005) reported conversion rates of 5 tonnes of wood to 1 tonne of pulp, and 1.5 tonnes of pulp to 1 tonne of paper. According to ICARD (2002a), 5 tonnes of wood can produce 1 ton of paper. Table 3 reports the conversion rates estimated by ICARD (2008).

Lack of up-to-Date and Detailed Data

There are many data series about wood and wood-processing products that need more frequent, for instance, annual provincial data on prices, quantities supplied, quantities demanded, income, expenditure and design production capacities of wood-processing factories. GSO data are usually reported at aggregate levels (mainly the national level), focusing on the main economic industries and high-revenue commodities (including rice, coffee, garments and textiles). Data for new industries and established low-revenue industries (e.g. woodchip and engineered-wood products) are usually updated infrequently. The data published in annual statistical yearbooks cover only forest area, number of state forestry enterprises, and total volume and value of exports for representative products. For example, the GSO (2008) data for the furniture sub-industry about wooden furniture did not classify products by species, type or design production capacities of enterprises and products (e.g. tables, chairs, doors and windows), by province or by economic region. Another example relates to the engineered-wood sub-industry. GSO (2008) provides only the number of engineered-wood enterprises and did not classify these by type of enterprise, for instance manufacturing, trading, intermediate-processing or final-processing enterprises.

As of December 2008, there was no single statistical dataset about sawmill and furniture sub-industries covering all provinces in Vietnam. For the paper sub-industry, historical data about paper factories were scattered. For example, Vietnam's first paper factory commenced operation in 1912 and had a design production capacity of 2,500 tonnes a year (Lang 2001b). No details are available about the spatial location, type of ownership and period of operation of this factory. There is also no information about other paper factories existing prior to 1954. During 1954–1975, there were more than 23 state-own paper factories in northern Vietnam. The three largest factories were Viet Tri Paper enterprise (10,000 tonnes/year), a paper enterprise in northern Hanoi City (5,000 tonnes/year) and a crafting paper enterprise in southern Hanoi City (Lang 2001b). No similar information about the other 20 paper factories in northern Vietnam (from Quang Tri province to the northern border) was published, nor was there any information for paper factories in southern Vietnam (from Thua Thien Hue province to the southern border) for this period. As another example, in 2006, Vietnam had about 300 paper enterprises but

detailed information—for instance about design production capacities and quantities supplied—are only available for large-scale state-owned paper enterprises.

Causes of Inconsistency in Data and Limitations of the Current Statistical System in Vietnam

Various causes of inconsistency in data for the wood and wood-processing industries can be identified.

Lack of Clear Definitions of *Sub-Industry*, *Factory* and *Enterprise*

The statistical time-series and cross-sectional data published in Vietnam have been improved with clearer concepts and formulae since 1990, especially for traditional high-value commodities including coffee, rice, garments and textiles. However, in the newly growing wood-processing industry, concepts have not been clearly articulated. Researchers and policy makers encounter many difficulties in understanding and describing statistical data. Two notable examples are concepts of *wood-processing sub-industries* producing particular products and concepts of *factories* and *enterprises*.

In the GSO's statistics in 2008 about export revenue in 2007, the wood-processing industry was classified into three wood-processing sub-industries, namely wood and bamboo processing, pulp and paper, and wood and wooden products (GSO 2008). The classification was not sufficiently clear for readers to know which products belong to which sub-industry. For instance, the products of chairs made out of *acacia* timber could belong to the wood and bamboo or the wood and wooden products sub-industry. Barney (2005) classified the wood-processing industry into three sub-industries—woodchip, pulp and paper, and engineered-wood products—which seems a clearer and simpler classification to understand. However, these classifications are not consistent with the concept published by MARD, as described by Nguyen et al. (2006, p. 28) '*The wood-processing activity in Vietnam is defined as the process to transform raw materials of wood to new products with the particular characteristics of shapes, sizes and chemical structure by the application of equipment, machines and chemical stuffs*'. Generally, this concept is based on the stages to produce intermediate and final wood-processing products, as presented in Fig. 1.

Some concepts which are published still remain controversial. MARD (2007) concluded that the classification of forest in Vietnam needs to be researched more because there are only two types of functional forest in developed countries, namely production forest and protection forest while Vietnam has three types, including the additional type of *special-use forest*. According to the definitions published by the Ministry of Forestry (MoF), a production forest in Vietnam is a forest '*used to produce timber, forest products and special forest products*' (MoF 1996, p. 365). A protection forest in Vietnam is a forest '*used to protect landscapes and environment*' (MoF 1996, p. 358). A special-use forest in Vietnam is a forest '*that*

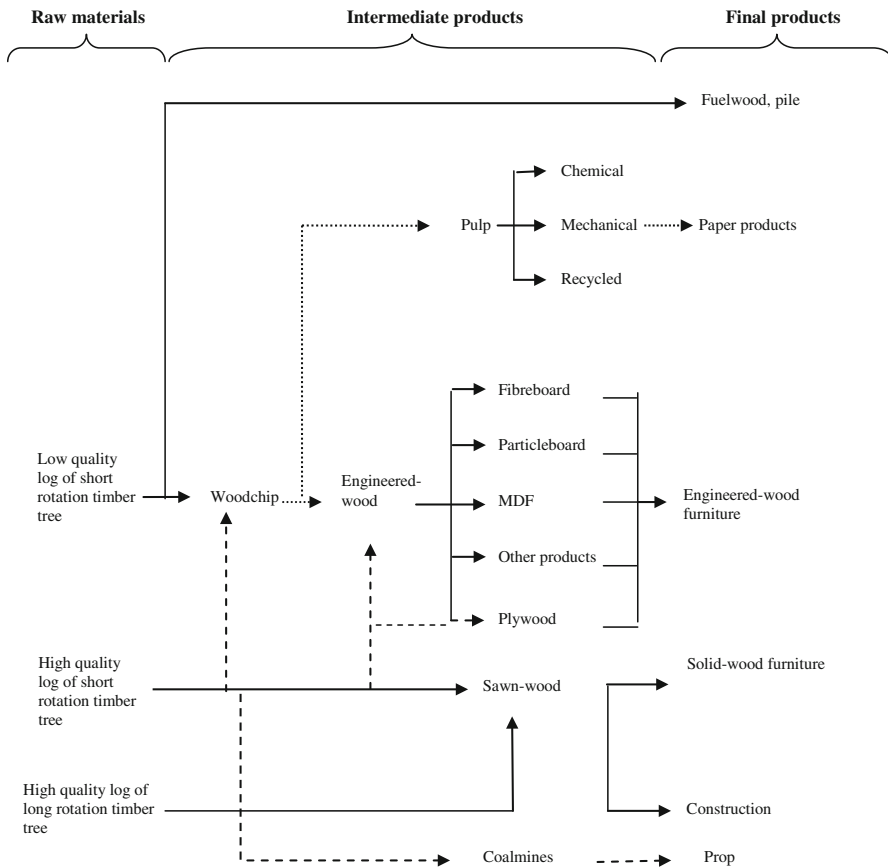


Fig. 1 Main stages to manufacture wood-processing products. *Source:* Based on ICARD (2002a, b), Barney (2005), Nguyen et al. (2006), Lamb and Huynh (2006), ICARD (2008)

is used to protect nature, historical remains and health and serve the demand of science research and other special-purposes' (MoF 1996, p. 360).

The concepts of *enterprise* and *factory* belonging to the wood-processing industry are also not considered in official publications. The two concepts are together used without clear separation. The unclear concepts lead to difficulty in understanding the statistical data. For example, when reading a reported number of total paper enterprises, a reader will not know whether this is the number of paper enterprises or the number of paper factories. Another example is the reported quantity of woodchip output in a specific year. Readers do not know if the output quantities are produced by woodchip enterprises or woodchip factories because some woodchip factories can belong to engineered-wood and paper enterprises. Figure 2 illustrates simply the distinction between *enterprise*, *factory* and *sub-industry*.

The name *paper factory* may refer to a paper factory, pulp factory or woodchip factory. The woodchip sub-industry includes three types of woodchip factories,

Paper enterprise	Engineered-wood enterprise	Woodchip enterprise	
Paper factory	Engineered wood factory		
Pulp factory			
Woodchip factory	Woodchip factory	Woodchip factory	} Woodchip sub-industry

Fig. 2 An example of the differences between *sub-industry*, *enterprise* and *factory*

belonging to paper, engineered-wood and woodchip factories. The data published about the quantity of the woodchip output in Vietnam usually reflects the quantities produced by woodchip enterprises, and therefore does not include the woodchip output produced by the paper and engineered-wood enterprises.

The Recent Restructure and Revision of Functions of State Organisations

There are currently at least 11 state organisations in Vietnam with state responsibilities to provide data about wood and wood-processing products for research and management purposes, as listed in Fig. 3. Two of these organisations are not administered by the Ministry of Agriculture and Rural Development (MARD), namely the General Statistical Office (GSO) belonging to the Ministry of Planning and Investment (MoPI) and a state statistical centre belonging to the Ministry of Industry and Trade (MoIT). The remaining nine state organisations are under MARD. Full names of the state organisations and their abbreviations are presented in Table 4. A further data source arises from studies conducted by international organisations and by co-operation between domestic and international research organisations.

Before 2006, GSO was the only government organisation having state or official responsibility to collect and publish statistical data for all physical products and services in Vietnam. Ministries did not have their own statistical system. Data for management were obtained mainly from GSO and could be from local state organisations¹ (e.g. DARD) but not recorded and released regularly. Since early 2006, because GSO could not provide sufficiently detailed information to support the demand of research and management, each Vietnamese Ministry has been allowed by the GoV to establish its own statistical centre to collect data for its use in research and management. These data are accessible to both statistical centres of ministries and to the GSO.

ICARD is the statistical state organisation under MARD and has the responsibility to manage the websites of all state organisations under MARD. The ICARD official website address is <http://www.agroviet.gov.vn/>. Since 2002, ICARD has been the only state organisation collecting and storing market information about 10

¹ In Vietnam, *local state organisations* means state organisations situated in provinces, districts and communes, whereas *central state organisations* usually means ministries situated in the capital Hanoi.

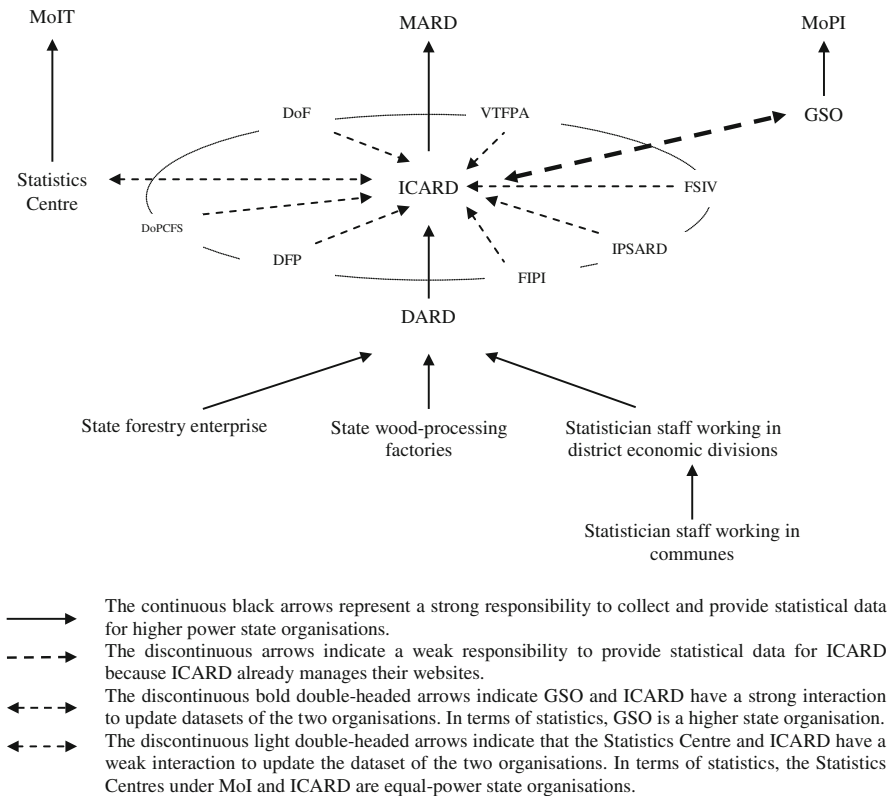


Fig. 3 The statistical system designed by MARD to support research and management since September 2006

Table 4 Full names and their abbreviations of the state organisations providing data about wood and wood-processing products

Full name	Abbreviation
Ministry of Agriculture and Rural Development	MARD
Ministry of Industry and Trade	MoIT
Forest Investigation and Planning Institute	FIPI
Forestry Science Institute of Vietnam	FSIV
Vietnam Timber and Forest Product Association	VTTPA
Department of Processing, Commercial Forestry, Fisheries and Salt	DoPCFS
Department of Forestry	DoF
Forestry Protection Department	DFP
Institute of Policy and Strategy for Agriculture and Rural Development	IPSARD
Informatics and Statistics Centre for Agriculture and Rural Development	ICARD
Provincial Departments of Agriculture and Rural Development	DARD

major agricultural products, including wood and wood-processing products. ICARD's Division of Website has been in charge of these activities. The data collected and analysed are presented on the website <http://xttm.agroviat.gov.vn/>. Because ICARD did not have its own data collection network in the 2002–2006 period, ICARD had to collect data from news on-line and newspapers (including rural and agricultural newspapers), from customs offices and from news via satellite purchased from Reuters. In the years 2002–2006, ICARD was funded by MARD to set up its own market information trial network in three provinces, namely Lao Cai, Long An and Nghe An. Since early 2006, ICARD has been funded by the Asian Development Bank (ADB) to set up a trial network to collect market information in 20 representative provinces throughout all of Vietnam including 100 districts. Since early 2007, with MARD's permission, ICARD has used an official network of state organisations to provide statistical information from commune level to central level. In mid-2008, ICARD was tasked by MARD to undertake data analysis and agricultural market forecasting. Figure 3 summarises the statistical system that was designed in 2005 to support detailed research and state management. The characteristics of the arrows in Fig. 3 present the extent of relationship between organisations. Until December 2008, strong relationships (shown by continuous black arrows) only existed because of direct state responsibility. Policy-makers are trying to enforce state organisations under MARD to publish their information officially and provide their statistical data to ICARD.

ICARD implements two main activities. One is the establishment of a set of statistical indicators with clear concepts and mathematical formulae that will be collected at regular intervals. The set includes statistics on wood and wood-processing products. The other activity is to select statistical software that can store collected data in the most effective way, for instance ensuring ease of data entry and retrieval. Since December 2008, ICARD has been conducting the first of these activities for wood and wood-processing products.

Data can also be published by three domestic research institutes in the agricultural sector, namely the Forest Investigation and Planning Institute (FIPI), Forestry Science Institute of Vietnam (FSIV) and Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD). These three institutes are under the management of MARD. Statistical data collected and research reports prepared by FSIV and FIPI respectively focus on tree species, area by species and harvesting rotations of species in various climate and geography conditions. FSIV has a Forest Economic Research Division, and every year it conducts research related to forest business and forest policies. For instance Vo (2004) investigated product markets from planted production forest in northern mountainous provinces.

The Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) has been the only state organisation having a function of policy analysis since September 2004. IPSARD has a division having a responsibility to conduct policy research, namely the Division of Policy and Strategy Research (DSPR). The Division's website is <http://ipsard.gov.vn/dspr/>. Due to their recent establishment, in December 2008, their research activities as yet only focus on research methodologies and mathematical-economic models including general equilibrium models.

Generally, the data of the research reports are not published on websites and hence are not readily accessible.

The final data source is reports produced by international research organisations and by the cooperation between domestic research institutes and international research organisations. The positive points of these data sources are that the data adopt a clear methodology and are easy to access. Notable research reports are those of ICARD (2002a, b), Barney (2005), Meulen (2006), Karsenty (2006) and Lamb and Huynh (2006). The disadvantage of these data sources is that data collection is irregular and the data focus only on specific areas (e.g. districts and provinces).

Concluding Comments

Reform policies for markets and land management commenced in Vietnam in 1986, mainly in agricultural and industrial production and the banking system. Implementation of the reform policies in the forestry and wood-processing industry only commenced in 1993. The changes or adjustment of the Vietnamese statistical system were even slower, beginning in 2005. Many new state organisations have been established recently. Consequently, data published about wood and wood-processing products are usually based on unclear concepts, and are inconsistently published, aggregated and irregularly updated. Overall, these characteristics create difficulties for researchers and policy-makers working at MARD to analyse policy and to manage effectively these two industries. Two main suggestions are raised to improve the forestry information system. First, the co-operation between state organisations needs to be strengthened to set up a system of clear concepts for wood and wood-processing products and sub-industries. Second, the information networks (e.g. computers and internet connection) between state organisations warrant further development.

Acknowledgments Funding for this research from a John Allright Fellowship is gratefully acknowledged. I would like to thank my principal PhD supervisor Steve Harrison at The University of Queensland, Australia for review comments and suggestions on this paper, and also Drs David Lamb, Sharon Brown and Peter Dart for their advice and encouragement. I would also like to thank my colleagues working at various state organisations under MARD—including Dr. Trinh Duc Huy, Ms. Nguyen Thanh Huong, Mr. Vu Dinh Xuan, Mr. An Van Khanh and Mr. Tran Lam Dong—for support in obtaining data and checking the consistency of information presented in this paper. Finally, I would like to thank reviewers who provided valuable comments on this paper.

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